

Forthcoming event: Publication of study on pilot error and the causes of accidents

Ashgate Publishing has announced that in January 2007 it will start delivery of the book *The Limits of Expertise: Rethinking Pilot Error and the Causes of Airline Accidents*, by Key Dismukes, Ben Berman, and Loukia Loukopoulos. This book is the final report of an extensive study of how cognitive factors make even well-trained, highly competent pilots vulnerable to sometimes fatal errors. It also examines how task, situation, and organizational factors contribute to and combine with errors, in ways partly systematic and partly random, to produce accidents.

The study examined the complete set of 19 major U.S. airline accidents from 1990 through 2000 in which the NTSB found crew error to be a probable cause. Because it is rarely possible to know with any certainty why an accident crew made the errors they did, our study took the approach of asking why any highly experienced crew in the situation of the accident crew and knowing only what that crew knew at each moment of the accident scenario might be vulnerable to similar errors. Using this concept of a population of pilots exposed to the same situation we were able to identify a range of factors likely to influence crew performance in that situation. (See a previous hot topic for more details on this approach). We found that the accidents clustered around six patterns, defined as much by the situations confronting the pilots as by the errors made:

1. Inadvertent slips and oversights while performing highly practiced tasks under normal conditions
2. Inadvertent slips and oversights while performing highly practiced tasks under challenging conditions
3. Inadequate execution of non-normal procedures under challenging conditions
4. Inadequate response to rare situations for which pilots are not trained
5. Judgment in ambiguous situations
6. Deviation from explicit guidance or SOP

We analyzed in detail cross-cutting factors, several of which were present in all of these accidents:

- Situations requiring rapid response
- Challenges of managing concurrent tasks
- Equipment failure and design flaws
- Misleading cues or missing cues normally present
- Plan continuation bias
- Stress

- Shortcomings in training and/or guidance
- Social/organizational issues

The final chapter analyzes the concept of causality in aviation accidents, pointing out that conventional concepts are often simplistic and are inadequate for developing better ways to protect the safety of flight operations. We suggest specific, practical measures the aviation industry can take to reduce vulnerability to error and to make it less likely that errors will propagate into accidents. These measures include suggestions for improving the design of cockpit interfaces, training and operating procedures, for improving organizational practices, and for collecting and analyzing data essential to understanding safety issues.

Although this study focuses on the cognitive and organizational underpinnings of pilot error, the issues and principles discussed apply to the skilled performance of professionals in all domains in which safety is a concern. We hope that this book helps readers better understand the errors made by conscientious but imperfect experts on whom our lives depend--not just pilots but also air traffic controllers, mechanics, medical personnel, law enforcement officers, and many more. And perhaps it will also make the frustrating little errors we all make in everyday life a little less mysterious.

The book can now be ordered from Ashgate or through [Amazon.com](https://www.amazon.com).